REMARKS

Reconsideration of the above-identified application in view of the amendment above and the remarks below is respectfully requested.

Claims 1-5 and 9 have been canceled in this paper. Claims 6-8 have been amended in this paper. No new claims have been added in this paper. Therefore, claims 6-8 are pending and under active consideration.

Claims 1-9 stand rejected under 35 U.S.C. 103(a) "as being unpatentable over Schmitt et al (US 4,435,163) in view of Azerad et al. (US 2004/0091845)." In support of the rejection, the Patent Office states the following with respect to independent claims 1 and 6:

> Schmitt discloses a method for learning and training dental treatment techniques, according to which forces are applied to a tooth (e.g. pressure) held in an artificial mandible (e.g. artificial jaw) by means of a tool or by hand in order to examine or treat the tooth, in which case the mandible or the tooth is coupled with a force measuring device (e.g. pressure-sensitive element) which converts the forces applied to the tooth into electric measurement signals that are fed to a data processing device (e.g. microprocessor) which comprises a data memory (e.g. to retrieve appropriate sound). Schmitt does not specifically disclose force/time courses of different treatment steps. However, Azerad discloses a multitude of reference force/time courses (e.g. MH models for each tooth) (See P.3, [0051]) of different treatment steps are stored (e.g. in handtools and teeth library) in a manner that enables them to be retrieved (See Fig. 3 and P. 3, [0071]), the method comprising the following steps:
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> - Selection of a reference force/time course appropriate to a tooth treatment to be learned or trained (e.g. selecting the tooth to be inserted in virtual jaw) (See P. 3, [0070]),
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> - start of the simulated tooth treatment,
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> - measuring of the forces applied to the tooth by means of a tool or by hand by means of the force measuring device coupled with the mandible or the tooth and determination of the amount and direction thereof in the course of the time e.g. as the drilling continues

> deep in the tooth)(See Fig. 2A and 2B), whereby this actual force/time course is simultaneously with the selected reference force/time course or values derived from it represented on an optic display unit (See Fig. 1A), and
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> - determination as to whether the force/time courses or values derived from them show a predetermined correlation among each other (See P.3, [0071]). Azerad further discloses a program (e.g. driver program or user interface program), which controls the data processing device in a way that allows the selected reference force/time course and the actual force/time course of the simulated tooth treatment to be presented on an optic display (See P.3, [0054]-[0055]).
>
> Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to incorporate the force feedback system of Azerad into the system and method of Schmitt in order to design a system that provides a closes to reality models for training purposes.

Insofar as the subject rejection relates to claims 1-5 and 9, the rejection is moot in view of Applicants' cancellation herein of these claims. Insofar as the subject rejection relates to claims 6-8, Applicants respectfully traverse the subject rejection.

Claim 6, from which claims 7 and 8 depend, relates to a device for learning and training in dental treatment methods according to which forces are exerted onto a tooth secured in a jaw model, by means of a hand or by using a tool, for examining or working on the tooth.

According to the invention, the jaw model is fixed to a single sensor, which is constructed as a six-component force-moment sensor and sends measuring signals to a data processor. The measuring signals are imaged as forces according to their magnitude and direction in the data processor. Furthermore, the data processor comprises a data memory in which a plurality of reference-force-time curves of different dental treatment steps are stored as a table of values that can be called up. In addition, a program is provided, which controls the data processor such that a

selected reference-force-time curve and the actual force-time curve of the simulated dental treatment can be represented on an optical display.

Schmitt relates to an educational device for teaching dental hygiene, with which the correct use of a tooth brush can be examined and supervised. For this purpose, electronic components for detecting the movement of the tooth brush are arranged in the teeth and in the gums. However, the Schmitt device is not suited for learning and training in dental treatment methods with which forces are exerted onto a tooth secured in a model of a jaw, manually or by using a tool, in order to examine or to work on the tooth because these forces must be measured very precisely. Also, it must be possible to recognize from which direction these forces are acting.

As compared to Schmitt, the present invention has no electronic components arranged in the teeth and in the gums. Consequently, the present invention can be made cost-effectively. In addition, the device of the present invention is less susceptible to disturbances because a single but very robust six-component force-moment sensor is used only. As the jaw model can be mounted onto such a sensor without causing problems, the sensor can be large in size.

If a person of ordinary skill in the art attempted to use Schmitt to accomplish the object of the present invention, he would have to take into account the following considerations:

A prerequisite for learning and training in dental treatment methods, with which forces are exerted onto a tooth to examine or to work on it, is that the tooth and the jaw with teeth, respectively, have sizes corresponding to that found in nature. When feeling a tooth by means of a needle, a person of ordinary skill in the art knows that he has to hit spots distant from each other by 0.1 to 0.5 mm only. In other words, the minute motor activity of the hand used to feel the tooth must be trained so that spots very close to each other can be distinguished. In some cases, it is necessary to use a pair

of spectacles or a magnifier to distinguish between such spots. Carrying out examination on a jaw model greater than a natural one is not suited to learn such minute motor activity and is rejected as an unsuitable principle by those of ordinary skill in the art. On the other hand, a person of ordinary skill in the art knows that it is impossible or at least extremely costly to arrange force sensors at a distance of about 0.1 mm to each other on the total surface of a tooth having a natural size. As not only one tooth has to be equipped with about one hundred force sensors, but this is required for all of the teeth of a jaw, costs for realizing this would be immensely high. In addition, sensors having such a small size have not been available heretofore. Furthermore, each of these sensors would have to be capable of detecting the direction in which the force acts. However, according to the present state of knowledge, force sensors having such a small size are not capable of doing so. Alternatively, it is possible to use a camera system or another suited tracking system, but in this case, the extent of necessary equipment would increase the costs still further.

Therefore, an advantage of the present invention is that a dentist can use a finger to check if a tooth is still stuck or loose. All he has to do is to apply pressure onto a part of the surface of the tooth to be examined. According to Schmitt, by contrast, for physical reasons and reasons of measurement technique, it would be extremely difficult to determine the total actual force and the direction in which it acts from the pressure applied by a finger onto several sensors.

Finally, it must be mentioned that a tooth model should be as realistic as possible with regard to the surface thereof. However, this is difficult to realize with a tooth equipped with many sensors.

Knowing the problems mentioned above, a person of ordinary skill in the art would not have tried to use Schmitt's teachings to develop a device for learning and training in dental treatment

methods, with which forces are exerted onto a tooth secured in a jaw model, by means of a hand or by using a tool.

Azerad concerns a generally known force-feedback system where a tool is coupled to a movable arm generating a force feedback. Also, a person of ordinary skill in the art will be informed to implement reference-force-time curves into the force-feedback system.

As contrasted with Azerad, the present invention does not use a force-feedback system, but rather, uses reference force-time curves.

According to the present invention, an actual force-time curve is compared to a stored force-time curve. This only enables the learning and training effect to be gained.

In conclusion, Schmitt and Azerad do not individually or collectively teach or suggest the present invention.

Accordingly, for at least the above reasons, the subject rejection should be withdrawn.

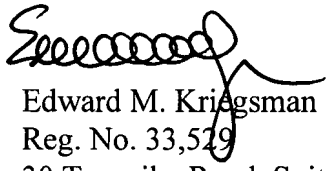
In conclusion, it is respectfully submitted that the present application is in condition for allowance. Prompt and favorable action is earnestly solicited.

If there are any fees due in connection with the filing of this paper that are not accounted for, the Examiner is authorized to charge the fees to our Deposit Account No. 11-1755. If a fee is

required for an extension of time under 37 C.F.R. 1.136 that is not accounted for already, such an extension of time is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted,

Kriegsman & Kriegsman

By: 

Edward M. Kriegsman
Reg. No. 33,529
30 Turnpike Road, Suite 9
Southborough, MA 01772
(508) 481-3500

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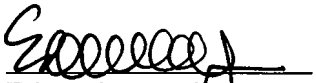

Edward M. Kriegsman